

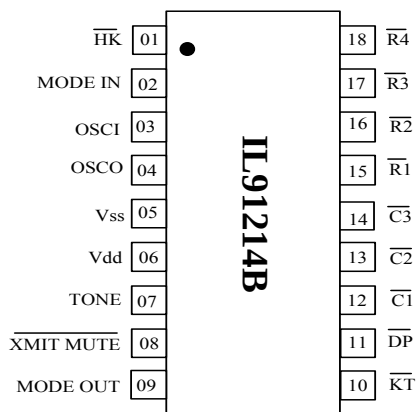
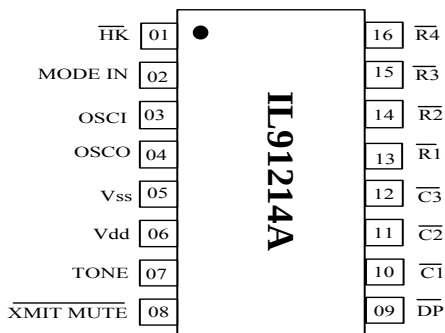
Tone/Pulse Dialer with Handsfree Control and Flash Function

IL91214A and IL91214B are tone/pulse dialers designed for providing standard DTMF or pulse signals. The ICs enable to:

- generate standard DTMF or pulse signals of dialing as well as “flash” pulses;
- store and redial last number;
- generate pause in the transmitted package of dial signals;

ICs are designed to be used in telephone sets.

PIN DESCRIPTION



Pin #		Designation	Description
A	B		
1	1	HK	Hook switch input
2	2	MODE IN	MODE IN = V _{DD} : pulse mode, 10 Hz, M/B = 1/2, MODE IN = V _{SS} : tone mode, MODE IN = floating mode, 20 Hz, M/B = 1/2
3	3	OSCI	Oscillator input
4	4	OSCO	Oscillator output
5	5	V _{SS}	Ground
6	6	V _{DD}	Supply output
7	7	TONE	Tone dialing output
8	8	XMIT MUTE	Dialing transmission mute output
	9	MODE OUT	Mode output pin
	10	KT	Key-in tone output
9	11	DP	Dialing pulse output
10	12	C1	Keyboard column input
11	13	C2	Keyboard column input
12	14	C3	Keyboard column input
13	15	R1	Keyboard row input
14	16	R2	Keyboard row input
15	17	R3	Keyboard row input
16	18	R4	Keyboard row input

Fig. 1.
Pin configuration in package

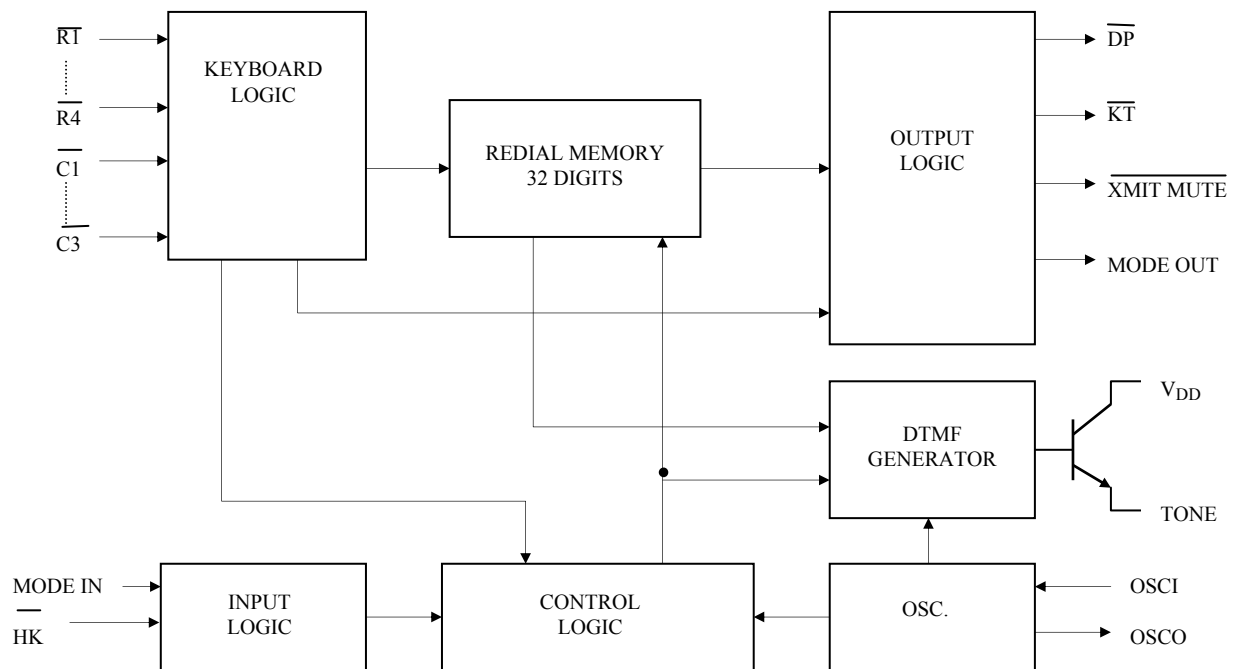


Fig. 2. Block diagram.

DC electrical characteristics

($V_{DD} = 3.5\text{ V}$, $V_{SS} = 0\text{ V}$, $F_{OSC} = 3.579\text{ MHz}$, $T = 25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Min.	Typ	Max.	Condition	
Supply voltage, V	V _{DD}	2.0		5.5	Pulse mode	
		2.0		5.5	Tone mode	
Memory retention voltage, V	V _{MR}	1				
Memory retention current, uA	* I _{MR}		0.05	0.4	V _{DD} = 1.0 V HK = V _{DD}	All outputs unloaded
Operation current, mA	I _{DDP}		0.32	1.0	Pulse	
	I _{DDT}		0.6	2.0	Tone	
Standby current, uA	* I _{SO}		0.03	0.05	$\overline{\text{HK}}=\text{V}_{\text{DD}}$	All outputs unloaded. No key selected. V _{DD} =1.5V
			0.5	10	$\overline{\text{HK}}=\text{V}_{\text{SS}}$	
Input voltage, V	V _{IH}	0.8 V _{DD}		V _{DD}	V _{DD} = 3.5 V	
	V _{IL}	0		0.2 V _{DD}		
<u>Input</u> current R1-R4, uA	I _R		115			
Tone out voltage, mV	V _{OC}	584	730	876	Column	V _{DD} =3.5V R _L =5K
	V _{OR}	456	570	684	Row	
<u>Sink</u> current XMUTE, mA	I _{OL1}	0.9	5.3		V _{DD} =3.5V, V _{OL} =0.4V	
<u>Sink</u> current DP, mA	I _{OL2}	1.1	5.3		V _{DD} =3.5V, V _{OL} =0.4V	
Distortion, %	DIS %		1	5		

* - in this mode IC functioning is not guaranteed.

AC characteristics

($V_{DD} = 3.5\text{ V}$, $V_{SS} = 0\text{ V}$, $F_{OSC} = 3.579\text{ MHz}$, $T = 25^{\circ}\text{C}$, unless otherwise specified)

Parameter	Symbol	Min.	Typ	Max.	Condition	
					Dialing speed, pps	
Make time, ms	T_M		33.3		10	M/B=1/2
			16.7		20	M/B=1/2
Break time, ms	T_B		66.6		10	M/B=1/2
			33.3		20	M/B=1/2
Inter-digit pause time, ms	T_{IDP}		824		10 pps	
			458		20 pps	
Pause time, s	T_{PAU}		2.2			
Auto-redial break time, s	T_{AOBK}		2.2			

Parameter	Symbol	Min.	Typ	Max.	Condition
Delay time key valid to signal out, ms	T_D		0		
Key-in debounce, ms	T_{KD}		21		
Key-in tone duration, ms	T_{KTD}		23		
Key-in tone frequency, Hz	F_{KT}		437		
Minimal tone duration time, ms	T_{MFD}		94		
Minimum tone inter-digit pause, ms	T_{TIDP}		96		
Redial tone duration, ms	T_{MFDR}		94		
Redial tone inter-digit duration, ms	T_{TIDPR}		96		

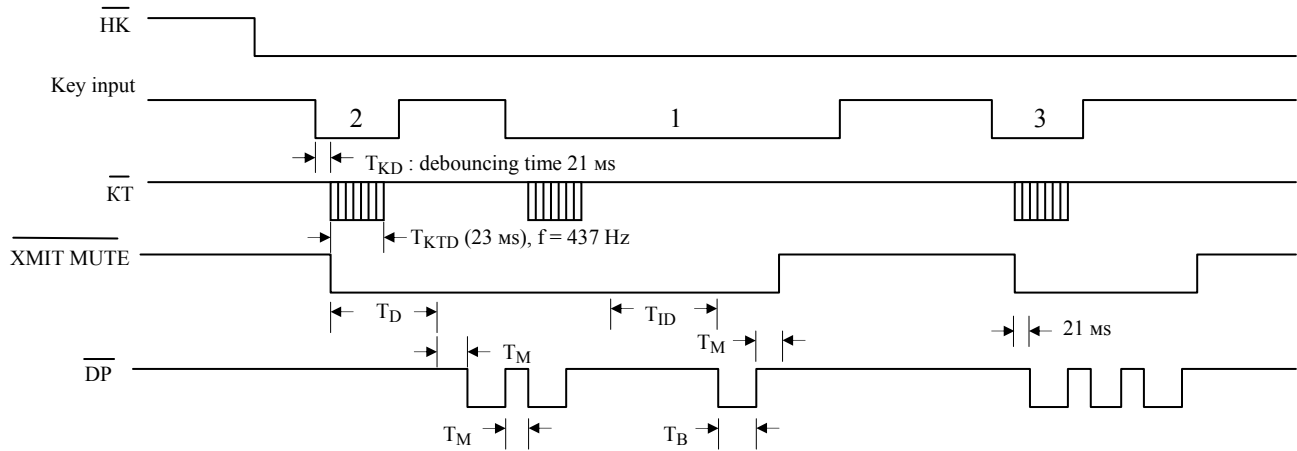
Values of generated frequencies

R/C	Frequency	Error, %	Unit	Conditions
$\overline{R1}$	697	+ 0.31	Hz	FOSC = 3.579 MHz
$\overline{R2}$	770	+ 0.19	Hz	
$\overline{R3}$	852	+ 0.03	Hz	
$\overline{R4}$	941	+ 0.10	Hz	
$\overline{C1}$	1.209	+ 0.57	Hz	
$\overline{C2}$	1.336	- 0.32	Hz	
$\overline{C3}$	1.477	- 0.35	Hz	

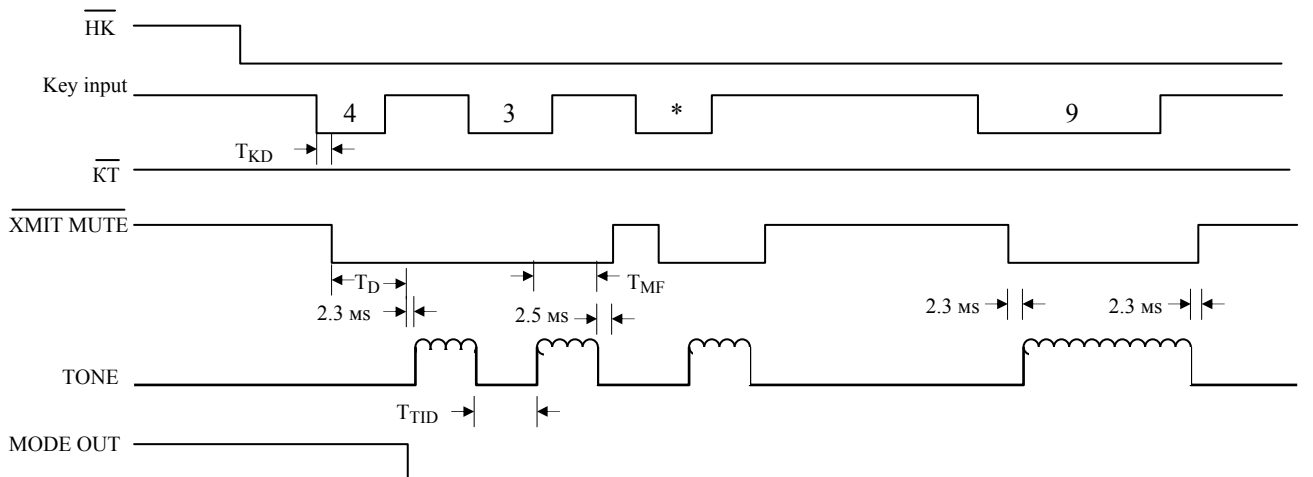
Absolute maximum ratings

Parameter		Absolute maximum value
Supply voltage	V_{DD}	$\leq 6.0V$
Input voltage	V_{IN}	$V_{SS}-0.3V \sim V_{DD}+0.3V$
Output voltage	V_{OUT}	$V_{SS}-0.3V \sim V_{DD}+0.3V$
Output voltage (DP, XMIT MUTE).	V_{OUT}	$\leq 1.2V$
Tone output current	I_{TONE}	$\leq 50\text{ mA}$
Power dissipation	P_D	$\leq 500\text{ mW}$
Storage temperature	T_{STG}	$-40^{\circ}C \sim +125^{\circ}C$

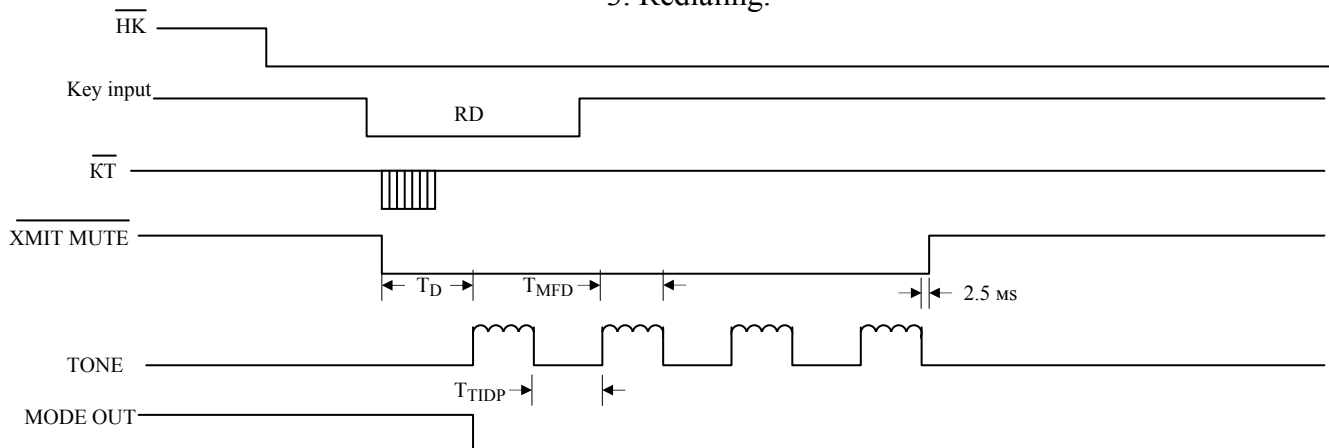
1. Pulse dialing mode.



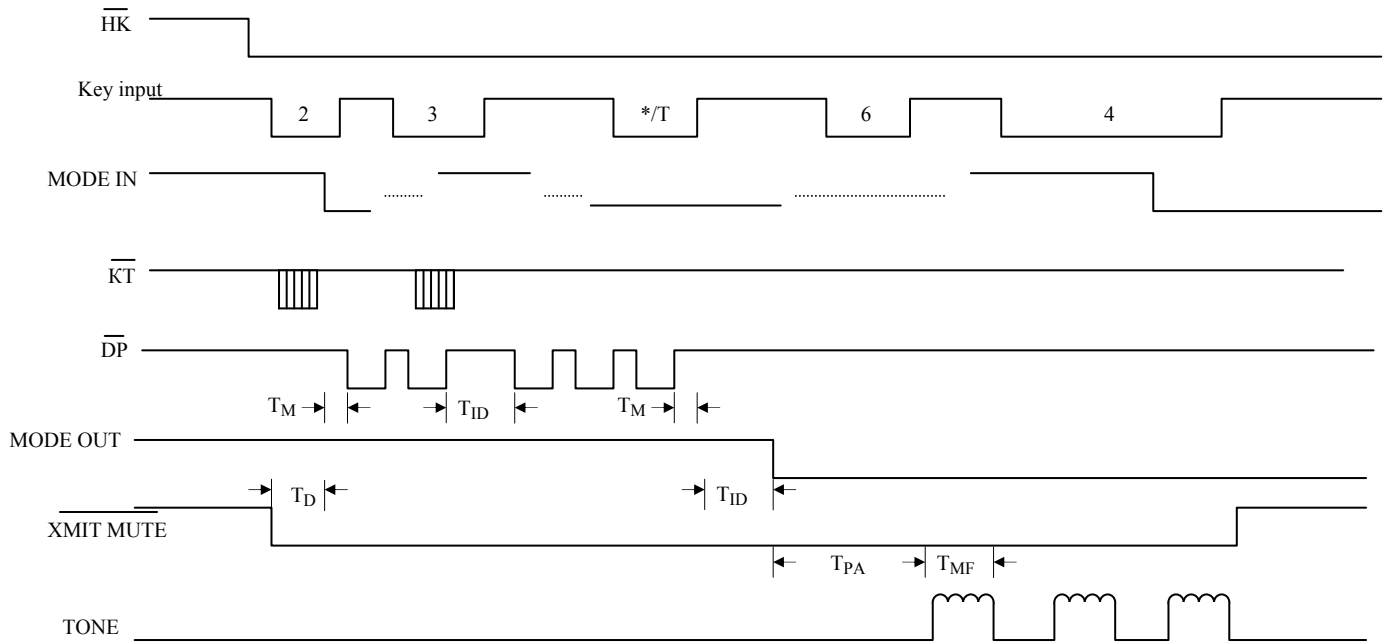
2. Tone dialing mode.



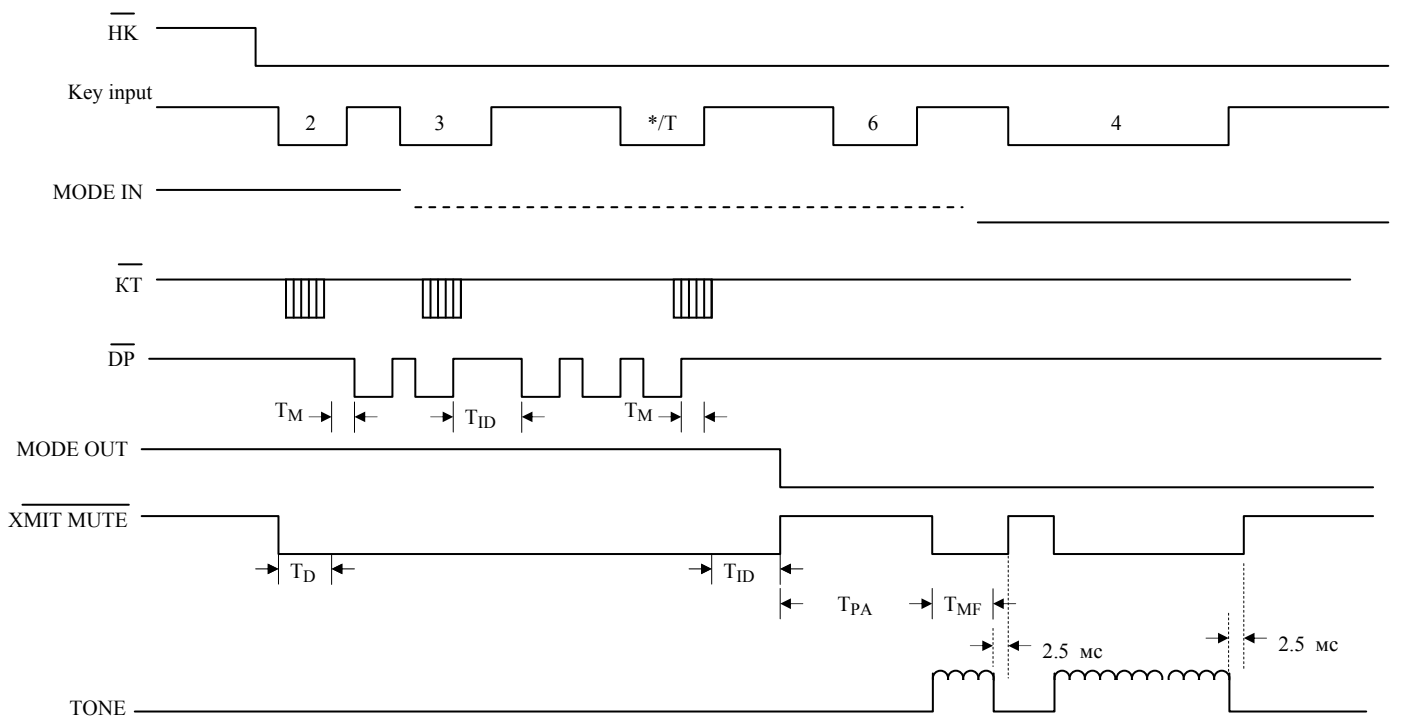
3. Redialing.



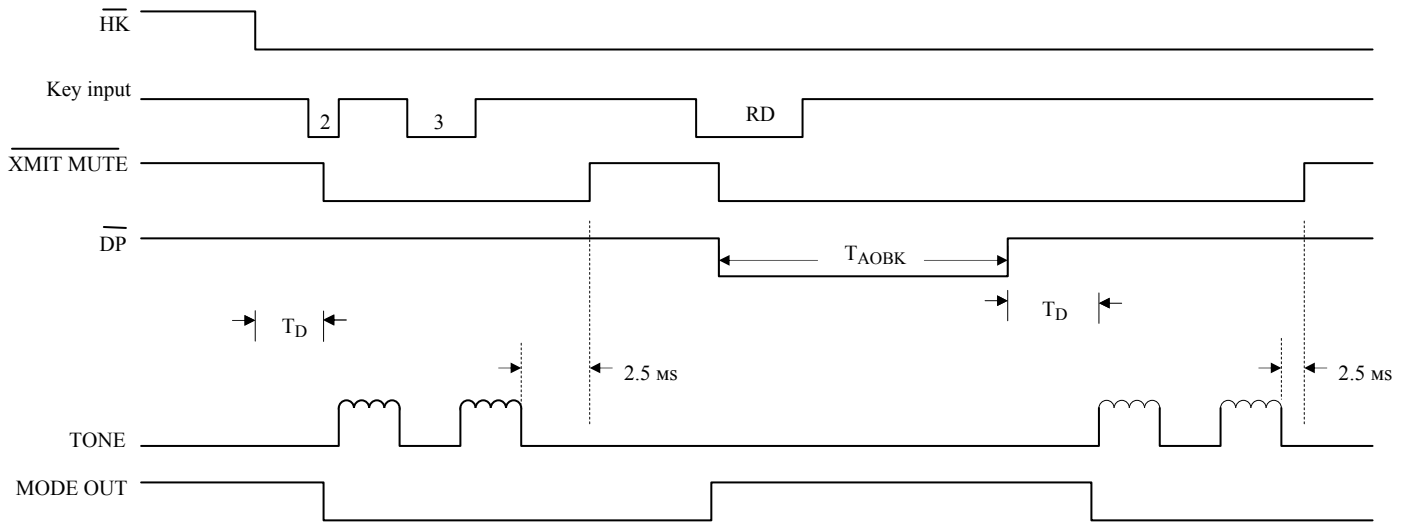
4. Switching mode operation (MODE IN control).



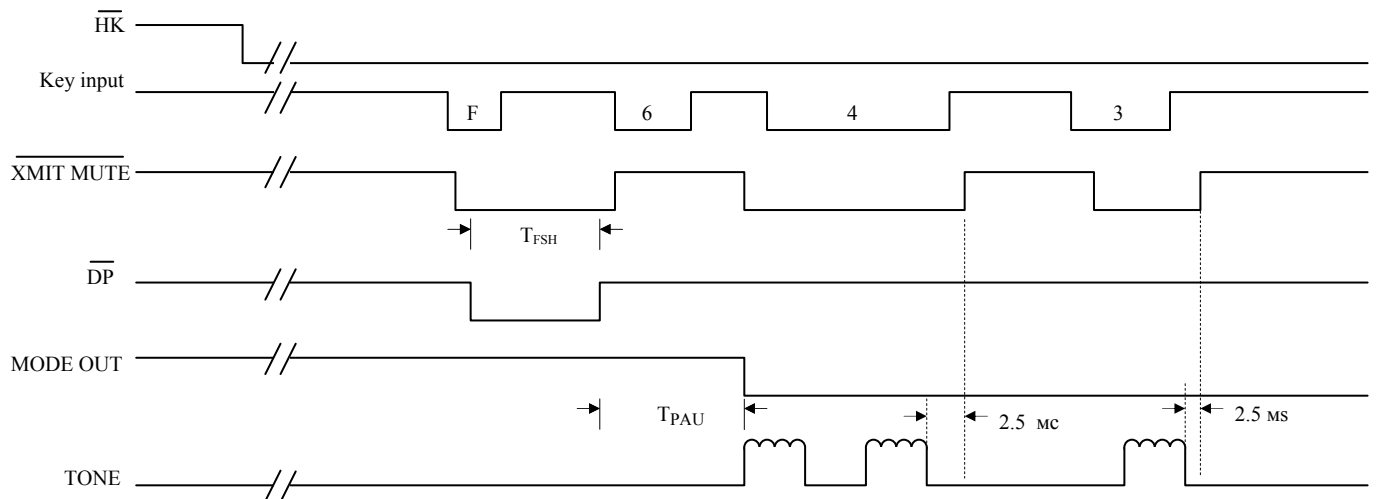
5. Switching mode operation (* / T key entry).



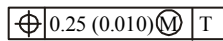
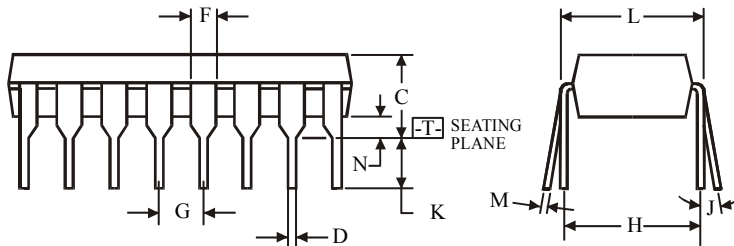
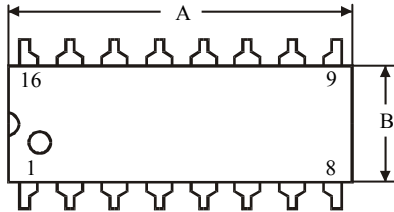
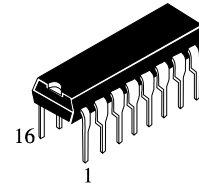
6. One key redial using RD key (DTMF mode for example).



7. Flash dialing



N SUFFIX PLASTIC DIP
(MS - 001BB)

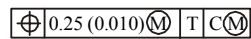
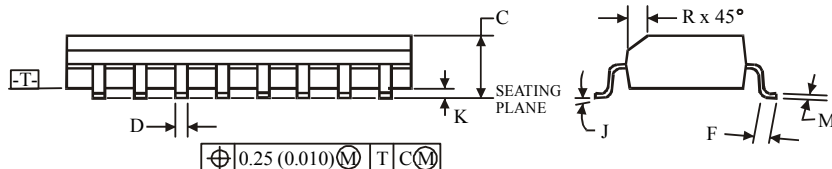
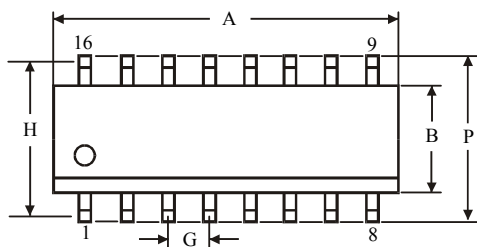
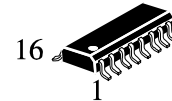


NOTES:

- Dimensions "A", "B" do not include mold flash or protrusions.
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

	Dimension, mm	
Symbol	MIN	MAX
A	18.67	19.69
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

D SUFFIX SOIC
(MS - 012AC)

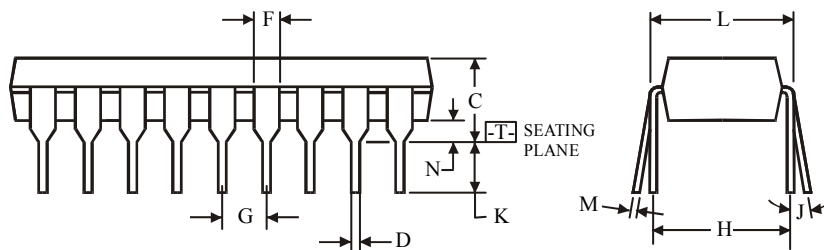
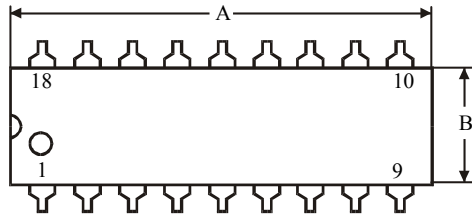
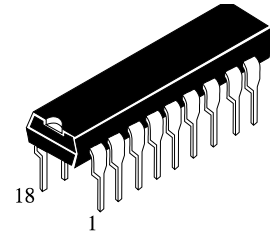


NOTES:

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side
for A; for B - 0.25 mm (0.010) per side.

	Dimension, mm	
Symbol	MIN	MAX
A	9.8	10
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.72	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5

N SUFFIX PLASTIC DIP
(MS - 001AC)



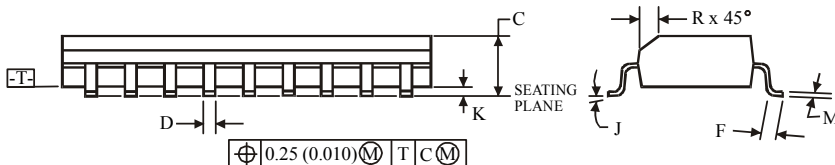
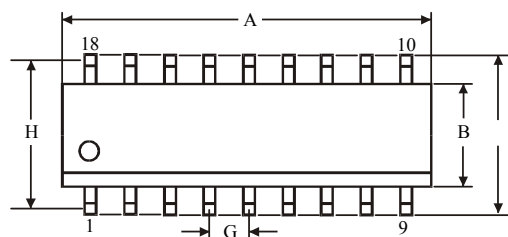
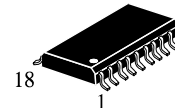
$\oplus 0.25 (0.010) \text{ (M)} \text{ (T)}$

NOTES:

- Dimensions "A", "B" do not include mold flash or protrusions.
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

	Dimension, mm	
Symbol	MIN	MAX
A	22.35	23.37
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

D SUFFIX SOIC
(MS - 013AD)



$\oplus 0.25 (0.010) \text{ (M)} \text{ (T)} \text{ (C)} \text{ (M)}$

NOTES:

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side
for A; for B - 0.25 mm (0.010) per side.

	Dimension, mm	
Symbol	MIN	MAX
A	10.1	10.5
B	7.4	7.6
C	2.35	2.65
D	0.33	0.51
F	0.4	1.27
G	1.27	
H		
J	0°	8°
K	0.1	0.3
M	0.23	0.32
P	10	10.65
R	0.25	0.75